

S  
331.252  
T1r  
1999/2000

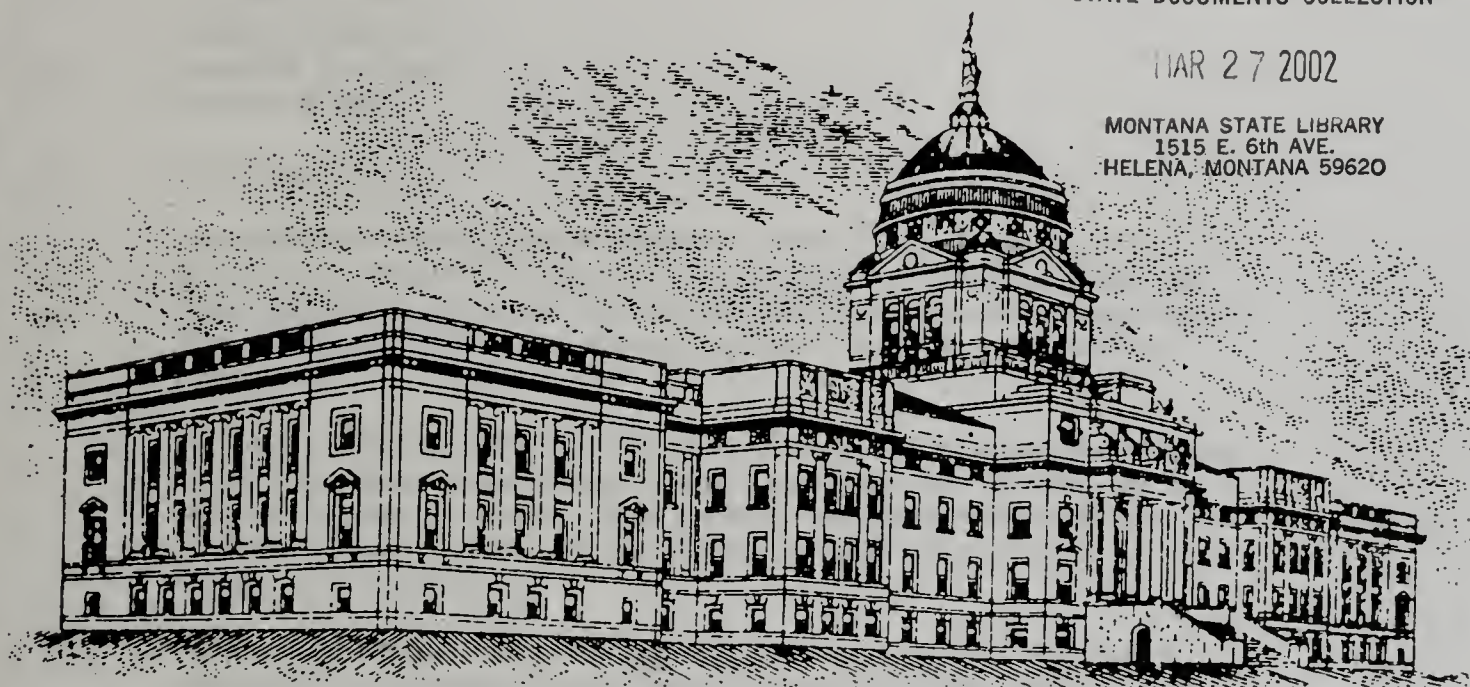
# MONTANA

## Teachers' Retirement System Component Unit of the State of Montana

STATE DOCUMENTS COLLECTION

MAR 27 2002

MONTANA STATE LIBRARY  
1515 E. 6th AVE.  
HELENA, MONTANA 59620



# ANNUAL REPORT

FISCAL YEARS ENDED JUNE 30, 2000 AND 1999

---

Judy Martz, Governor



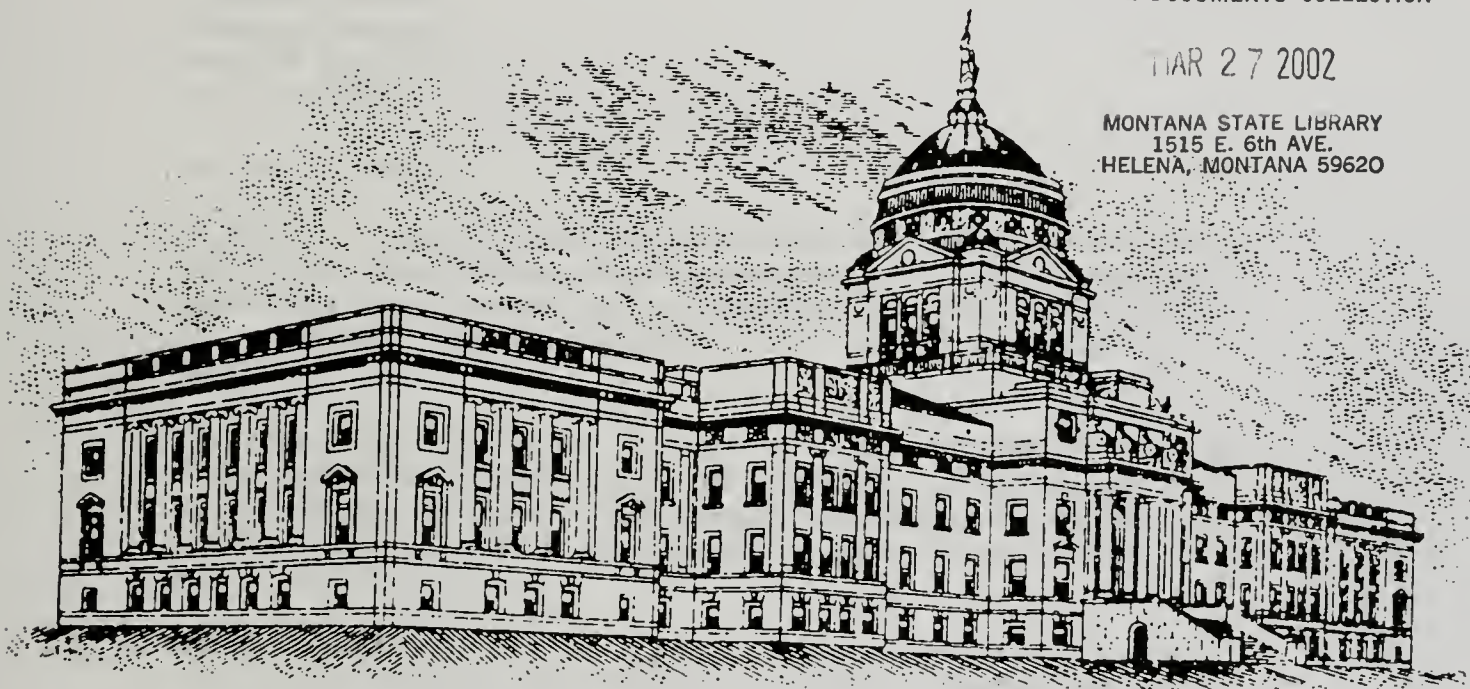
# MONTANA

## Teachers' Retirement System Component Unit of the State of Montana

STATE DOCUMENTS COLLECTION

MAR 27 2002

MONTANA STATE LIBRARY  
1515 E. 6th AVE.  
HELENA, MONTANA 59620



# ANNUAL REPORT

FISCAL YEARS ENDED JUNE 30, 2000 AND 1999

---

Judy Martz, Governor

MONTANA STATE LIBRARY



**3 0864 0015 3488 5**

February 6, 2001

Honorable Judy Martz  
Governor of Montana  
Room 204, State Capitol  
Helena, MT 59620

Dear Governor Martz:

On behalf of the Montana Teachers' Retirement Board, it is my pleasure to submit to you the 2000 Annual Report. This report reflects that the system is meeting its mission of maintaining a financially sound system while providing the broadest and fairest possible range of retirement, disability and survivor benefits for members, retirees and their beneficiaries.

The Teachers' Retirement System is fortunate to have as members of the Board, men and women who possess the highest degree of ethics, devotion to duty and dedication to Montana educators. The members of the Board give generously of their time and talents to oversee the functions of the system and ensure that members receive the benefits they have earned and justly deserve.

On behalf of the Board, I would like to thank the staff, the Board's advisors, and the many people who continue to work diligently to assure the successful operation and improvement of the financial soundness of the Montana Teachers' Retirement System. The Teachers' Retirement Board and staff look forward to continuing to serve the educators of Montana.

Sincerely,

David L. Senn  
Executive Director

DLS/pc



## TABLE OF CONTENTS

	PAGE
BOARD OF DIRECTORS, ADMINISTRATIVE OFFICERS AND PROFESSIONAL CONSULTANTS .....	5
FINANCIAL SECTION .....	7
INDEPENDENT AUDITOR'S REPORT	
STATEMENT OF PLAN NET ASSETS	
STATEMENT OF CHANGES IN PLAN NET ASSETS	
NOTES TO FINANCIAL STATEMENTS	
REQUIRED SUPPLEMENTARY INFORMATION	
ACTUARIAL SECTION .....	23
ANALYSIS OF VALUATION	
APPENDICES	
STATISTICAL SECTION .....	69
REVENUES BY SOURCE AND EXPENSES BY TYPE	
CONTRIBUTION RATES	
ACTIVE MEMBERS	
RETIRED MEMBERS	
LOCATION OF BENEFIT RECIPIENTS	







# **THE TEACHERS' RETIREMENT SYSTEM DIRECTORS AND OFFICERS**

## **BOARD OF DIRECTORS**

JIMA SEVERSON CHAIR	07-01-97 to 07-01-01
TIM RYAN VICE CHAIR	07-01-00 to 07-01-04
EMILY H. BOGUT	07-01-98 to 07-01-02
SCOTT DUBBS	07-01-99 to 07-01-03
VIRGINIA EGLI	07-01-97 to 07-01-01
JAMES TURCOTTE	07-01-97 to 07-01-01

## **ADMINISTRATIVE OFFICERS**

DAVID L. SENN	Executive Director
TAMMY RAU	Assistant Executive Director

## **PROFESSIONAL CONSULTANTS**

MILLIMAN & ROBERTSON, INC.	Actuaries & Consultants Seattle, WA 98101
ICEMILLER	Legal & Business Advisors Indianapolis, IN 46282

**ALTERNATIVE ACCESSIBLE FORMATS OF THIS DOCUMENT WILL BE PROVIDED UPON REQUEST.**



# **FINANCIAL SECTION**

**INDEPENDENT AUDITOR'S REPORT**

**STATEMENT OF PLAN NET ASSETS**

**STATEMENT OF CHANGES  
IN PLAN NET ASSETS**

**NOTES TO FINANCIAL STATEMENTS**

**REQUIRED SUPPLEMENTAL INFORMATION**

# LEGISLATIVE AUDIT DIVISION

Scott A. Seacat, Legislative Auditor  
John W. Northey, Legal Counsel  
Tori Hunthausen, IT & Operations Manager



Deputy Legislative Auditors:  
Jim Pellegrini, Performance Audit  
James Gillett, Financial-Compliance Audit

## INDEPENDENT AUDITOR'S REPORT

The Legislative Audit Committee  
of the Montana State Legislature:

We have audited the accompanying Statement of Plan Net Assets of the Teachers' Retirement System, a component unit of the state of Montana, as of June 30, 2000 and 1999, and the related Statement of Changes in Plan Net Assets for the fiscal years then ended. The information contained in these financial statements is the responsibility of the system's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Teachers' Retirement System as of June 30, 2000 and 1999, and its changes in plan net assets for the fiscal years then ended in conformity with generally accepted accounting principles.

The Schedules of Funding Progress and Contributions from the Employer and Other Contributing Entities are not a required part of the basic financial statements but are supplementary information required by the Governmental Accounting Standards Board. We have applied certain limited procedures, which consisted principally of inquiries of management regarding the methods of measurement and presentation of the supplementary information. However, we did not audit the information and express no opinion on it.

The Actuarial Section and Statistical Section listed in the foregoing table of contents are presented for the purpose of additional analysis and are not a required part of the basic financial statements of the Teachers' Retirement System. Such information has not been subjected to the auditing procedures applied in our audit of the financial statements and, accordingly, we express no opinion on it.

Respectfully submitted,

*(Signature on File)*

James Gillett, CPA  
Deputy Legislative Auditor

February 13, 2001

**TEACHERS' RETIREMENT SYSTEM  
COMPONENT UNIT OF THE STATE OF MONTANA  
STATEMENT OF PLAN NET ASSETS  
JUNE 30, 2000 AND 1999**

	<u><b>2000</b></u>	<u><b>1999</b></u>
<b>ASSETS</b>		
Current Assets:		
Cash	\$1,916,110	\$3,306,674
Cash Equivalents-Short Term		
Investment Pool (Note A)	36,688,720	61,559,792
Accounts Receivable	12,736,240	11,779,032
Interest Receivable	<u>5,912,427</u>	<u>7,438,288</u>
Total Current Assets	<u>\$57,253,497</u>	<u>\$84,083,786</u>
Investments, at fair value (Note A):		
Mortgages	\$108,366,068	\$102,437,199
Investment Pools	2,095,349,225	1,977,630,593
Other Investments	<u>122,957,015</u>	<u>66,557,772</u>
Total Investments	<u>\$2,326,672,308</u>	<u>\$2,146,625,564</u>
Securities Lending Collateral (Note A)	\$164,091,655	\$164,691,227
Other Assets:		
Land and Buildings	\$193,844	\$193,844
Less: Accumulated Depreciation	(113,536)	(109,772)
Intangible Assets, net of amortization (Note E)	2,665,846	660,425
Equipment	137,249	137,249
Less: Accumulated Depreciation	<u>(89,379)</u>	<u>(76,257)</u>
Total Other Assets	<u>\$ 2,794,024</u>	<u>\$ 805,489</u>
<b>TOTAL ASSETS</b>	<u><b>\$2,550,811,484</b></u>	<u><b>\$2,396,206,066</b></u>
<b>LIABILITIES</b>		
Accounts Payable	\$180,590	\$498,522
Securities Lending Liability (Note A)	164,091,655	164,691,227
Compensated Absences (Note A)	68,503	50,888
Property Held In Trust	10,809	20,360
Installment Purchase Payable (Note D)	<u>2,158,794</u>	<u>227,068</u>
<b>TOTAL LIABILITIES</b>	<u><b>\$166,510,351</b></u>	<u><b>\$165,488,065</b></u>
<b>NET ASSETS HELD IN TRUST FOR PENSION BENEFITS (Schedule of Funding progress page 18)</b>	<u><b>\$2,384,301,133</b></u>	<u><b>\$2,230,718,001</b></u>

**TEACHERS' RETIREMENT SYSTEM  
COMPONENT UNIT OF THE STATE OF MONTANA  
STATEMENT OF CHANGES IN PLAN NET ASSETS  
FISCAL YEARS ENDED JUNE 30, 2000 AND 1999**

	<u><b>2000</b></u>	<u><b>1999</b></u>
<b>ADDITIONS</b>		
Contributions:		
Employer	\$47,848,084	\$44,986,852
Plan Member	45,599,246	42,641,714
Other	<u>674,345</u>	<u>102,540</u>
Total Contributions	\$94,121,675	\$87,731,106
 Rental Income	 \$22,325	 \$19,975
Workers Comp. Dividend	109	217
 Investments Income:		
Net Appreciation/(Depreciation) in Fair Value of Investments	 \$72,977,469	 \$147,506,436
Investment Earnings	<u>104,117,526</u>	<u>93,901,242</u>
Total Investment Income	\$177,094,995	\$241,407,678
 Less: Investment Expense	 <u>2,218,534</u>	 <u>1,576,861</u>
 Net Investment Income	 \$174,876,461	 \$239,830,817
 Security Lending Income (Note A)	 8,807,265	 8,600,474
Less: Security Lending Expense (Note A)	<u>8,448,563</u>	<u>8,110,090</u>
Total Security Lending Income	\$ 358,702	\$ 490,384
 Total Net Investment Income	 <u>\$175,235,163</u>	 <u>\$240,321,201</u>
 Total Additions	 <u>\$269,379,272</u>	 <u>\$328,072,499</u>
 <b>DEDUCTIONS</b>		
Benefit Payments	\$109,231,029	\$100,028,083
Withdrawals	5,271,306	5,126,013
Administrative Expense (Note E)	<u>1,293,805</u>	<u>1,360,660</u>
Total Deductions	\$115,796,140	\$106,514,756
 <b>NET INCREASE IN PLAN NET ASSETS</b>	 \$153,583,132	 \$221,557,743
 <b>NET ASSETS HELD IN TRUST FOR PENSION BENEFITS</b>		
<b>BEGINNING OF YEAR</b>	2,230,718,001	2,009,159,213
PRIOR PERIOD ADJ. (Note A)	<u>0</u>	<u>1,045</u>
<b>END OF YEAR</b>	<u>\$2,384,301,133</u>	<u>\$2,230,718,001</u>



**TEACHERS' RETIREMENT SYSTEM  
COMPONENT UNIT OF THE STATE OF MONTANA  
NOTES TO THE FINANCIAL STATEMENTS  
FISCAL YEARS ENDED JUNE 30, 2000 AND 1999**

**NOTE A. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

**Basis of Accounting**

The Teachers' Retirement System (TRS), a discretely presented component unit Pension Trust Fund of the State of Montana financial reporting entity, maintains its accounts on the full accrual basis of accounting. Employee and employer contributions are recognized as revenues in the period in which employee services are performed and expenses are recorded when the corresponding liabilities are incurred, regardless of when payment is made.

**Valuation of Investments**

Investments are reported at fair value. Short-term investments and state securities are recorded at cost which approximates fair value. Mortgages were decreased by unamortized mortgage discount of \$24,743 in fiscal year 2000 and \$28,087 in fiscal year 1999. No investment in any one organization represents 5% or more of the net assets available for pension benefits. Investment units are bought/sold on the first business day of each month upon the decision of the Board of Investment's (BOI) Chief Investment Officer.

The six areas of investment at June 30, 2000 include: Montana Stock Pool (MTCP); Montana International Equity Pool (MTIP); Montana Short-Term Investment Pool (STIP); Retirement Funds Bond Pool (RFBP); Montana Real Estate Pool (MTRP); and Other Investments.

1. MTCP portfolio consists of common stock in public corporations and convertible equity securities. Unit values were calculated weekly based upon the fair value of equity holdings and other assets until March 31, 2000. Effective April 1, 2000, unit values are calculated daily. Value at June 30, 2000 was \$981 per unit.

2. MTIP portfolio includes equity investments in four funds – BOI Internal International, Pyrford International, Schroder Investment Management NA and SG Pacific Assets Management. The four funds may invest in securities of foreign-based corporations listed on legal and recognized foreign exchanges as well as domestic exchanges. Security types may include ordinary common shares, preferred shares, convertible securities, American Depositary Receipts (ADR's), Global Depositary Receipts (GDR's) and other global securities, as appropriate. Unit values are calculated weekly based upon the fair value of equity holdings, other assets and liabilities. Value at June 30, 2000 was \$125.14 per unit.



3. STIP as per Montana Code Annotated (MCA) section 17-6-201, 202 and 204, requires investments by state agencies of available funds. Value at June 30, 2000 was \$1 per unit. STIP portfolio includes asset-backed, variable-rate and covered option securities to provide diversification and a competitive rate of return.

Asset-backed securities are debt securities collateralized by a pool of mortgage and non-mortgage assets pledged by the issuer and have one or more forms of credit enhancement to raise the quality of the security.

Variable rate securities provide many advantages of short-term bonds because they are designed to minimize the investor's interest rate risk. As with variable rate loans issued by banks, the interest rate paid by the issuer of these securities is reset periodically depending on market conditions. The value of these securities will usually remain at or near par because their interest rates are reset to maintain a current market yield.

Covered options are contracts granting the right, on a given date, to buy or sell bonds, backed by cash or the underlying securities, in exchange for an agreed-upon sum or premium.

According to the Governmental Accounting Standards Board (GASB) Statement No. 31, Accounting and Financial Reporting for Certain Investments and External Investment Pools, STIP is considered an external investment pool. An external investment pool is defined as an arrangement that pools the monies of more than one legally separate entity and invests, on the participant's behalf, in an investment portfolio. STIP is also classified as a "2a7-like" pool. A 2a7-like pool is an external investment pool that is not registered with the Securities and Exchange Commission (SEC) as an investment company, but has a policy that it will, and does, operate in a manner consistent with the SEC's Rule 2a7 of the Investment Company Act of 1940. If certain conditions are met, 2a7-like pools are allowed to use amortized cost rather than fair value to report net assets to compute unit values. The Board of Investments has adopted a policy to treat STIP as a 2a7-like pool.

4. RFBP portfolio includes corporate asset-backed, other corporate, U. S. government mortgage-backed, U. S. government and Yankee securities. Unit values are calculated weekly based on portfolio pricing. Value at June 30, 2000 was \$97.51 per unit. Realized portfolio gains/losses are distributed at least annually. The RFBP portfolio includes structured financial instruments known as REMICs (Real Estate Mortgage Investment Conduits). Some REMICs are principal-only strips (Pos) and interest-only (Ios). TRS has 40% ownership in the RFBP.

As of June 30, 2000, the Rite Aid Corporation presented a legal risk to the RFBP. The RFBP owns a \$7,000,000 par, 7.13% bond maturing January 15, 2007. In May 2000, the RFBP was subordinated to a secured bank line of credit on this issue and the bond ratings were downgraded by the Moody's and Standard & Poor's bond ratings agencies. Based on this subordination and ratings downgrade, BOI reduced the book value to \$5,600,000 as of June 30, 2000.

5. MTRP was created as of July 1, 1998, by a spin-off of the Real Estate Investment Trust (REIT) investments held in the Montana Stock Pool. REIT is a corporation that combines the capital of many investors to acquire or provide financing for all forms of real estate. REIT real estate investments may include shopping centers, office buildings, apartment complexes and hotels.

MTRP portfolio includes common or preferred stocks or securities convertible into common stock or preferred stocks. Unit values are calculated weekly based upon the fair value of REIT holdings. Unit value as of June 30, 2000 was \$469 per unit.

6. Other Investments are purchased in accordance with the statutorily mandated "Prudent Expert Principle" and applicable investment restrictions of the participants. The portfolio includes securities classified as corporate asset-backed, other corporate, U.S. government mortgage-backed, U.S. government, Yankee bonds, equity index, venture capital, leveraged buyouts, real estate, mortgages and loans. Corporate asset-backed securities represent debt securities collateralized by a pool of assets. U.S. government mortgage-backed securities reflect participation in a pool of residential mortgages. U.S. government securities include direct obligations of the U.S. Treasury and indirect obligations of the U.S. government. Yankee bonds are U.S. dollar denominated bonds issued by foreign corporations and governments and U.S. companies issuing debt in foreign markets. Equity index investments are investments in selected mutual funds whose equity portfolios match a broad based index or composite. In May 2000, BOI made its initial equity index investment in the S&P 500 Equity Index Fund. Venture capital represents private equity investments in early stage financing of rapidly growing companies with an innovative product or service. Leveraged buy-outs permit an investment group to acquire a company by leveraging debt, as a financing technique, to establish a significant ownership position on behalf of the company's current management team.

Fair values of investments for publicly traded securities are determined primarily by reference to market prices supplied to BOI by BOI's custodial bank, State Street Bank and Trust. The real estate investments and mortgages are valued based on a discounted cash flow. The commercial in-state coal tax loans and the nonparticipating repurchase agreements are reported at amortized cost.

Real Estate – In January 1996, BOI, on behalf of the Public Employees' and Teachers' Retirement Systems, purchased the 100 North Park Avenue building in Helena, Montana as a real estate investment. Acquired for a cost of \$4,864,326, the building carries a June 30, 2000 fair value of \$5,416,000.

In August 1997, BOI authorized the construction of an office building at 2401 Colonial Drive, as a real estate investment owned equally by the Public Employees' and Teachers' Retirement Systems. The three-story building, providing office space for three tenants, was occupied in November 1999. As of June 30, 2000, the building carries a cost and fair value of \$6,481,741 and \$7,581,000, respectively.

Securities Lending – Under the provisions of state statutes, BOI, via a Securities Lending Authorization Agreement, authorized the custodial bank, State Street Bank and Trust, to lend the BOI securities to broker-dealers and other entities with a simultaneous agreement to return the collateral for the same securities in the future. During the period the securities are on loan, BOI receives a fee and the custodial bank must initially receive collateral equal to 102 percent of the fair value of the loaned securities and maintain collateral equal to not less than 100 percent of the fair value of the loaned security. BOI retains all rights and risks of ownership during the loan period.

During fiscal year 2000, State Street loaned, on behalf of BOI, certain securities held by State Street, as custodian, and received U.S. dollar currency cash, U.S. government securities, and irrevocable bank letters of credit. State Street does not have the ability to pledge or sell collateral securities unless the borrower defaults.

BOI did not impose any restrictions during fiscal year 2000 on the amount of the loans that State Street made on its behalf. There were no failures by any borrowers to return loaned securities or pay distributions thereon during fiscal year 2000. Moreover, there were no losses during fiscal year 2000 resulting from a default of the borrowers of State Street.

During fiscal year 2000, BOI and the borrowers maintained the right to terminate all securities lending transactions on demand. The cash collateral received on each loan was invested, together with the cash collateral of other qualified plan lenders, in a collective investment pool, the Securities Lending Quality Trust. The relationship between the average maturities of the investment pool and BOI loans was affected by the maturities of the loans made by other plan entities that invested cash collateral in the collective investment pool, which BOI could not determine. On June 30, 2000, BOI had no credit risk exposure to borrowers.

### **Compensated Absences**

Compensated absences represent 100 percent of accrued vacation and 25 percent of accrued sick leave for Teachers' Retirement System personnel at June 30, 2000 and June 30, 1999.

### **Accounting and Reporting Changes**

Prior Period Adjustments – During fiscal year 1999, TRS received from the Public Employees' Retirement Board a refund of 70% of the interest assessment by the Social Security Administration and the STIP investment earnings. The assessment was for Social Security contributions for part-time employees for the years 1984-1986. PERB, the collecting agency, retained the interest payment owing SSA pending final settlement and invested the interest payment in STIP.



## NOTE B. DESCRIPTION OF PLAN

The Teachers' Retirement Board is the governing body of a mandatory multiple-employer, cost-sharing defined benefit pension plan, which provides retirement services to all persons in Montana employed as teachers or professional staff of any public elementary or secondary school, colleges of technology or unit of the university system. The system was established by the state of Montana in 1937 and is governed by Title 19, chapter 20, of the MCA.

At June 30, 2000, the number and type of reporting entities participating in the system was as follows:

Local School Districts	388
Community Colleges	3
University System Units	6
Colleges of Technology	3
State Agencies	<u>7</u>
Total	407

At June 30, 2000, the system membership consisted of the following:

Retirees and Beneficiaries	
Currently Receiving Benefits	8,640
Terminated Employees Entitled to But Not Yet Receiving Benefits	10,457
Current Active Members:	
Vested	11,978
Nonvested	<u>6,445</u>
Total Membership	37,520

The pension plan provides retirement benefits and death and disability benefits. Employees with a minimum of 25 years of service or who have reached age 60 with 5 years of service are eligible to receive an annual retirement benefit equal to 1.6667% times creditable service years times the average final compensation. Final compensation is the average of the highest three consecutive years of earned compensation. Benefits fully vest after 5 years of creditable service. Vested employees may retire at or after age 50 and receive reduced retirement benefits.

Effective January 1, 1988, university system employees eligible to participate in the Teachers' Retirement System could elect to participate in an Optional Retirement Plan established by the Board of Regents. As of July 1, 2000, a total of 3,573 university system employees have elected to participate in the Optional Retirement Plan. Effective July 1, 1993, membership in the Optional Retirement Plan is mandatory for new employees to the university system unless they are already an active or retired member of the Teachers' Retirement System.

#### **NOTE C. CONTRIBUTIONS**

The TRS funding policy provides for monthly employee and employer contributions at rates specified by state law. Plan members are currently required to contribute 7.15% of their earned compensation and employers contribute 7.47% of earned compensation. An actuary determines the actuarial implications of the funding requirement in biennial actuarial valuations. The actuarial method used to determine the implications of the statutory funding level is the entry age actuarial cost method, with both normal cost and amortization of the accrued liability determined as a level percentage of payroll. The actuarial valuation prepared as of July 1, 2000, the most recent valuation date, indicates the statutory rate was sufficient to fund the normal cost and to amortize the unfunded accrued liability under the entry age actuarial cost method over 15.1 years. During fiscal year 2000, legislation providing a Guaranteed Annual Benefit Adjustment of 1.5% payable each January was implemented for all retirees who had been receiving benefits for at least 36 months. This legislation also provided for a one-time ad hoc \$500 minimum benefit adjustment for any retiree who retired with at least 25 or more years of creditable service and on July 1, 1999 was receiving less than \$500 per month. The employee contribution rate was also increased from 7.044% to 7.15% and a State General Fund contribution of 0.11% was created. The employer contribution rate remained unchanged.

#### **NOTE D. INSTALLMENT PURCHASE PAYABLE**

During fiscal year 1999, TRS contracted for a new data processing system. Seven annual payments of \$431,944.01 began May 1, 2000 and conclude May 1, 2006; \$225,912.49 begin June 13, 2001 and conclude June 13, 2007; and \$130,862.24 begin July 1, 2001 and conclude July 1, 2007, for a total debt of \$5,521,031.18 which includes principal and interest of \$4,500,000.00 and \$1,021,031.18 respectively. The debt is recorded as services are rendered, less annual payments, for a total net accumulated Installment Purchase Payable of \$2,158,793.93 as of June 30, 2000.

## NOTE E. ADMINISTRATIVE EXPENSES

Administrative expenses for the years ended June 30, 2000 and 1999, are outlined below:

	<u>2000</u>	<u>1999</u>
Personal Services:		
Salaries	\$448,308	\$366,515
Other compensation	2,400	2,450
Employee benefits	<u>109,516</u>	<u>93,870</u>
Total Personal Services	\$560,224	\$462,835
Operating Expenses:		
Contracted services	\$199,013	\$266,324
Supplies and materials	43,785	34,929
Communications	32,228	37,801
Travel	27,012	14,574
Rent	32,184	25,884
Repair and maintenance	15,935	22,276
Other expenses	8,289	15,889
Interest Expense	122,257	*384,386
Depreciation	16,886	19,300
Amortization	<u>235,992</u>	<u>76,462</u>
Total Operating Expenses	\$733,581	\$897,825
<b>Total Administrative Expense</b>	<b><u>\$1,293,805</u></b>	<b><u>\$1,360,660</u></b>

\*Interest paid to Department of Administration on a \$6.5 million interentity loan for the fiscal year end 1997 retired payroll. The interest payment is an offset to investment earnings from July 1997 to July 1998.

**Teachers' Retirement System  
Component Unit of the State of Montana  
Required Supplementary Information**

**Schedule of Funding Progress  
(All dollar amounts in millions)**

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liabilities (AAL) <sup>(1)</sup>	Unfunded Actuarial Accrued Liabilities (UAAL) <sup>(2)</sup>	Funded Ratio <sup>(3)</sup>	Covered Payroll <sup>(4)</sup>	UAAL as a Percentage of Covered Payroll
July 1, 1992	\$ 954.5	\$ 1,533.9	\$ 579.3	62.2%	\$ 465.1	124.6%
July 1, 1994	1,157.5	1,712.9	555.4	67.6	472.9	117.4
July 1, 1996	1,376.7	1,939.6	562.9 <sup>(5)</sup>	71.0	501.5	112.2
July 1, 1998 <sup>(6)</sup>	1,809.0	2,123.3	314.3	85.2	529.8	59.3
July 1, 1998 <sup>(7)</sup>	1,809.0	2,342.7	533.7	77.2	529.8	100.7
July 1, 2000	2,247.5	2,648.3	400.8	84.9	537.5	74.6

(1) Actuarial present value of benefits less actuarial present value of future normal costs based on entry age actuarial cost method.

(2) Actuarial accrued liabilities less actuarial value of assets.

(3) Funded ratio is the actuarial value of assets expressed as a percentage of the actuarial accrued liabilities. Generally, the higher the funded ratio the stronger the stability of the system.

(4) Covered Payroll includes compensation paid to all active employees on which contributions are calculated.

(5) Note that although the UAAL increased from 1994 to 1996, the Covered Payroll increased more. Therefore, both the UAAL as a Percentage of Covered Payroll and the amortization period for the UAAL decreased.

(6) Results of July 1, 1998 Actuarial Valuation

(7) July 1, 1998 results adjusted for 1.5% GABA and \$500 minimum benefit for legislation which passed in April 1999 and the new salary scale adopted in November 1998.



**Teachers' Retirement System  
Component Unit of the State of Montana  
Required Supplementary Information**

**Schedule of Contributions from the Employer and Other Contributing Entities  
(All dollar amounts in thousands)**

<u>Fiscal Year Ending</u>	<u>Covered Employee Payroll (1)</u>	<u>Actual Employer Contributions (2)</u>	<u>Actual Employer Contribution % (2)</u>	<u>Annual Required Contribution (ARC) % (3)</u>	<u>Percentage of ARC Contributed</u>
6/30/1995	\$486,809	\$39,073	7.47%	7.47%	100%
6/30/1996	501,516	40,627	7.47	7.47	100
6/30/1997	511,934	41,640	7.47	7.47	100
6/30/1998	529,795	44,476	7.47	7.47	100
6/30/1999	543,071	44,987	7.47	7.47	100
6/30/2000	537,507	48,376	7.58	7.58	100

*(1) Computed as the dollar amount of the actual employer contribution made as a percentage of payroll excluding termination pay and Optional Retirement Plan (ORP) contributions divided by the contribution rate expressed as a percentage of payroll.*

*(2) The actual and required employer contributions are expressed as a percentage of payroll. Contributions for termination pay of \$5.1 million for Fiscal Year ended June 30, 2000, are included in the actual employer contribution, but are not made as a set percentage of payroll. Contributions made as a percentage of the salaries of the members in the ORP are included. In the Fiscal Year ended June 30, 2000, \$2.5 million was contributed based on ORP member salaries. The ORP contribution rate varies from year to year.*

*(3) All employer contributions are a percentage of actual payroll. Thus, as long as the percentage equals the percentage required by the most recent actuarial valuation, the dollar amount of the Annual Required Contributions (ARC) is equal to the actual dollar amount of the required employer contributions.*

**TEACHERS' RETIREMENT SYSTEM  
COMPONENT UNIT OF THE STATE OF MONTANA  
NOTES TO THE SUPPLEMENTAL SCHEDULES  
FISCAL YEARS ENDED JUNE 30, 2000 AND 1999**

**Actuarial Cost Method**

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate was defined to equal the total of the individual normal costs, divided by the total pay rate as of July 1, 2000.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the unfunded actuarial liability. The unfunded actuarial liability is amortized as a level percentage of the projected salaries of present and future members of the System.

**Valuation of Assets - Actuarial Basis**

Adopted July 1, 2000, the actuarial asset valuation method spreads asset gains and losses over five years. The expected return is determined each year based on the beginning of year market value and actual cash flows during the year. Any difference between the expected market value return and the actual market value return is recognized evenly over a period of five years. The gains and losses are measured starting with the year ended June 30, 1997.

**Investment Earnings**

The annual rate of investment earnings of the assets of the System is assumed to be 8%, compounded annually.

**Guaranteed Annual Benefit Adjustment Increases**

On January 1 of each year, the retirement allowance payable must be increased by 1.5% if the retiree's most recent retirement effective date is at least 36 months prior to January 1 of the year in which the adjustment is to be made.

### **Future Salaries**

The rates of annual salary increases assumed for the purpose of the valuation include a 5.0% annual rate of increase in the general wage level of the membership plus a variable merit and longevity rate from 0.05% to 4.04%. The merit and longevity increases for the Montana University System (MUS) members did not show a pattern of increasing or decreasing with service at the time of our most recent study. Therefore, the MUS members have a flat 1% merit and longevity assumption. The general wage increase assumption was adopted July 1, 1998 and the merit and longevity scales were adopted July 1, 2000.

MUS members are assumed to have a 0.63% higher average final compensation to account for the larger than average annual compensation increases observed in the years immediately preceding retirement.

### **Amortization Period**

The current employer contribution rate of 7.47% and the State General Fund contribution of 0.11% of members' salaries, is sufficient to meet the actuarial cost of the System accruing at the valuation date and to amortize the unfunded actuarial liability over 15.1 years. The actuarial costs are calculated using the entry age actuarial cost method.



# **ACTUARIAL SECTION**

## **ANALYSIS OF VALUATION**

- 1. SUMMARY OF FINDINGS**
- 2. SCOPE OF THE REPORT**
- 3. ASSETS**
- 4. ACTUARIAL PRESENT VALUE  
OF FUTURE BENEFITS**
- 5. EMPLOYER CONTRIBUTIONS**

## **APPENDICES**



**Teachers' Retirement System  
State of Montana**

**Section 1**

**Summary of Findings**

As a result of the actuarial valuation of the benefits in effect under the Montana Teachers' Retirement System as of July 1, 2000, we recommend that the current employer contribution rate, 7.58% of members' salaries, remain in effect. The contribution rate was increased from 7.47% to 7.58% in 1999 when benefits were improved.

The 7.58% rate is sufficient to meet the actuarial cost of the System accruing at the valuation date and to amortize the unfunded actuarial liability over 15.1 years. The actuarial costs are calculated using the entry age actuarial cost method. This actuarial valuation measures the adequacy of the contribution rates set in Montana State Law. MCA 19-20-604 states that the employer contribution rate will return to 7.47% when the amortization period of the System's unfunded actuarial liability is 10 years or less according to the System's latest actuarial valuation.

**Experience**

The 2000 actuarial valuation indicates that a substantial actuarial gain occurred during the preceding two fiscal years. The gain is primarily due to higher returns on the assets than expected by the actuarial assumptions, and is reflected in the 12.3% and 12.8% net investment return on an actuarial basis for the past two years. These asset gains, while significant, are not as pronounced as the asset gains reflected in the July 1, 1998 valuation. The following chart compares the annual returns for the past four years.

<u>Year</u>	<u>Market Return</u>	<u>Actuarial Return</u>	<u>Actuarial Return over 8.0% Assumption</u>
7/1/1996 to 6/30/1997	19.4%	14.9%	6.9%
7/1/1997 to 6/30/1998	16.6%	16.0%	8.0%
7/1/1998 to 6/30/1999	11.9%	12.3%	4.3%
7/1/1999 to 6/30/2000	7.8%	12.8%	4.8%

Asset gains result when the return on the actuarial value of assets exceeds the actuarial investment return assumption of 8.0%. The actuarial return on assets has exceeded the assumption by about 9% (4.3% + 4.8%) in the last two years as shown in the last column of the chart. In contrast, the actuarial return on assets in the two years preceding the July 1, 1998 valuation exceeded the assumption by approximately 15% (6.9% + 8.0%). The asset gains in the last two years reduced the unfunded actuarial liability (UAL) by about \$178 million. Without the asset gains the UAL would be closer to \$580 million instead of the \$402 million shown in Table 6.



### Assumption Changes

The results include changes to the individual salary increase assumptions as detailed in our study, dated November 11, 1998. The results also include changes to the mortality assumptions as detailed in our study dated May 2, 2000.

### Benefit and Contribution Changes

Both benefits and contribution rates have been changed since the July 1, 1998 actuarial valuation. The following benefit improvements were passed in the 1999 legislative session:

- a 1.5% guaranteed annual benefit adjustment starting 3 years after retirement, and
- a \$500 minimum benefit for members and beneficiaries retired at July 1, 1999 where the member at time of retirement had 25 years of service.

The following contribution rate increases were passed in the 1999 legislative session:

- The member contribution rate was permanently increased from 7.044% to 7.15%.
- The employer contribution rate was increased from 7.47% to 7.58% as long as the amortization period for the unfunded actuarial liability exceeds 10 years.

### Impact of Changes

The effect of the asset gains and other experience on the amortization period can be distributed approximately as follows:

#### Amortization Period Remaining at July 1, 2000

July 1, 1998 Valuation Amortization Period	9.2 years
Passage of time	- 2.0
Effect of Changes in Benefits and Contribution Rates	+ 19.8
Effect of Changes in Actuarial Assumptions	+ 4.5
Effect of Increased ORP Contributions	<u>0.0</u>
Expected Amortization Period at July 1, 2000	31.5 years
Effect of Actuarial Experience Gains and Losses:	
Investments (Gain)	-14.2
Salary Increases (Gain)	- 1.6
Retired Mortality (Gain)	- 0.8
Loss from Other Causes	+ <u>0.2</u>
	- 16.4
July 1, 2000 Valuation Amortization Period	+ 15.1 years

**Teachers' Retirement System  
State of Montana**

**Section 2**

**Scope of the Report**

This report presents the actuarial valuation of the Montana Teachers' Retirement System as of July 1, 2000.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets of the System. Sections 4 and 5 describe how the obligations of the System are to be met under the actuarial cost method in use.

The actuarial procedures and assumptions used in this valuation are described in Appendix A. The current benefit structure, as determined by the provisions of the governing law on July 1, 2000, is summarized in Appendix B. Schedules of valuation data classifying the data used in the valuation by various categories of contributing members, former contributing members, and beneficiaries make up Appendix C. Appendix D provides a brief summary of the System's recent experience. Comparative statistics are presented on the System's membership and contribution rates. Appendix E is a glossary of actuarial terms used in this report.

**Teachers' Retirement System  
State of Montana**

**Section 3**

**Assets**

In many respects, an actuarial valuation can be regarded as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is July 1, 2000. On that date the assets available for the payment of benefits are appraised. These assets are compared with the actuarial liabilities. The actuarial process thus leads to a method of determining what contributions by members and their employers are needed to strike a balance.

A new asset valuation method is being used beginning with the July 1, 2000 valuation. It was approved by the Board in November, 1998. The expected return is determined each year based on the beginning of year market value and actual cash flows during the year. Any difference between the expected market value return and the actual market value return is recognized evenly over a period of five years. The gains and losses are measured starting with the year ended June 30, 1997.

Table 1 summarizes the determination of the actuarial value of assets. Table 2 shows when asset gains or losses will be recognized in the actuarial value of assets. Table 3 summarizes historical asset returns since July 1, 1994 including the amount recognized by the actuarial asset valuation method which was greater or lesser than the actuarial investment return assumption.

**Teachers' Retirement System  
State of Montana**

**Table 1**

**Determination of Actuarial Value of Assets  
July 1, 2000**

**Determination of Recognized Investment Gains and Losses - Five-Year Smoothing**

A. Expected investment return – Year Ended 6/30/2000	\$ 177,642,214
B. Actual investment return – Year Ended 6/30/2000	\$ 173,958,072
C. Gains/(losses) – 2000 [B – A]	\$ (3,684,142)
D. Gains/(losses) – 1999	\$ 78,945,961
E. Gains/(losses) – 1998	\$ 147,873,557
F. Gains/(losses) – 1997	\$ 166,072,301
G. Rounding adjustment	\$ (2)
H. Gains/(losses) recognized at July 1, 2000 [1/5 C + 1/5 D + 1/5 E + 1/5 F + G]	\$ 77,841,533

**Determination of Actuarial Assets**

Actuarial value of assets July 1, 1999	\$ 2,012,408,180
Contributions less benefits	\$ (20,380,660)
Expected investment return	177,642,214
Recognized investment gains/(losses)	<u>77,841,533</u> <b>235,103,087</b>
<b>Actuarial value of assets July 1, 2000</b>	<b>\$ 2,247,511,267</b>
Unrecognized Gain	136,784,146
Market Value of Assets July 1, 2000 (Actuarial Value + Unrecognized Gain)	\$ 2,384,295,413

Note: The actuarial value of assets is equal to the expected value plus a five-year smoothing of market value gains and losses. The actuarial asset method was adopted for the July 1, 2000 actuarial valuation with actuarial value of assets set equal to market value of assets at July 1, 1996. Deferred asset gains and losses prior to July 1, 1996 are ignored.

**Teachers' Retirement System  
State of Montana**

**Table 2**

**Schedule of Investment Gain/(Loss) Recognition**

(in millions)

July 1, 2000

<u>Fiscal Year Ending 06/30</u>	<u>Market Value Investment Gain/(Loss) Over the Expected 8%</u>	<u>Investment Gain/(Loss) Recognized in Past Years</u>				<u>Investment Gain/(Loss) Recognized in Current Year</u>	<u>Investment Gain/(Loss) to be Recognized in Future Years</u>			
		<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
1997	\$ 166.1	*	\$ 33.2	\$ 33.2	\$ 33.2	\$ 33.2	\$ 33.2			
1998	147.9			29.5	29.5	29.5	29.5	\$ 29.5		
1999	78.9				15.8	15.8	15.8	15.8	\$ 15.8	
2000	(3.7)					(0.7)	(0.7)	(0.7)	(0.7)	\$ (0.7)
2001	0.0						0.0	0.0	0.0	0.0
2002	0.0							0.0	0.0	0.0
2003	0.0								0.0	0.0
2004	0.0									0.0

<u>Total Gain/(Loss) Recognized at Each Valuation Date</u>				
<u>Recognized</u>		<u>Scheduled to be Recognized**</u>		
*	\$33.2 \$62.7 \$78.5	\$77.8	\$44.6	\$15.1 \$ (0.7)

<u>Unrecognized Gain/(Loss) Remaining</u>			
\$ 136.8	\$59.0	\$14.4	\$ (0.7) \$ 0.0

\* The first gain/(loss) was measured in the fiscal year ending June 30, 1997.

\*\* The total gain/(loss) actually recognized in each future year will include additional amortizations of future gains and/or losses.

**Teachers' Retirement System  
State of Montana**

**Table 3**

**Historical Investment Returns\***

<b>Fiscal Year Ending</b>	<b>Market Returns</b>	<b>Actuarial Return</b>	<b>Actuarial Return Over 8.0% Assumption</b>
June 30, 1995	15.7%	8.9%	0.9%
June 30, 1996	12.4	10.4	2.4
June 30, 1997	19.4	14.9	6.9
June 30, 1998	16.6	16.0	8.0
June 30, 1999	11.9	12.3	4.3
June 30, 2000	7.8	12.8	4.8

*\* Returns reflect all investment returns, including investment income and realized and unrealized investment gains and losses, and are net of investment expenses and administrative expenses paid by the System.*



**Teachers' Retirement System  
State of Montana**

**Section 4**

**Actuarial Present Value of Future Benefits**

In the previous section, an actuarial valuation was related to an inventory process, and an analysis was given of the inventory of assets of the System as of the valuation date, July 1, 2000. In this section, the discussion will focus on the commitments of the System, which will be referred to as its actuarial liabilities.

Table 4 contains an analysis of the actuarial present value of all future benefits for contributing members, for former contributing members, and for beneficiaries. The analysis is given by type of benefit.

The actuarial liabilities summarized in Table 4 include the actuarial present value of all future benefits expected to be paid with respect to each member covered as of the valuation date. For an active member, this value includes a measure of both benefits already earned and future benefits to be earned. Thus, for all members, active and retired, the value extends over benefits earnable and payable for the rest of their lives and, if an optional benefit is chosen, for the lives of their surviving beneficiaries.

The actuarial valuation does not recognize liabilities for employees who become members and participate in the System after the valuation date.



**Teachers' Retirement System  
State of Montana**

**Table 4**

**Actuarial Present Value of Future Benefits  
for Contributing Members, Former Contributing  
Members, and Beneficiaries  
(All amounts are actuarial present values in millions)**

	July 1, 2000	July 1, 1998
	<u>Total</u>	<u>Total</u>
A. Active members		
Service retirement	\$ 1,559.9	\$ 1,368.7
Disability retirement	27.2	30.0
Survivors' benefits	44.1	46.4
Vested Retirement	35.0	30.1
Refund of Member Contributions	<u>35.9</u>	<u>34.9</u>
Total	\$ 1,702.1	\$ 1,510.1
B. Inactive members and annuitants		
Service retirement	\$ 1,201.7	\$ 863.5
Disability retirement	15.3	14.0
Beneficiaries*	76.0	58.3
Vested terminated members	40.0	31.6
Nonvested terminated members	<u>13.7</u>	<u>12.5</u>
Total	\$ 1,346.7	\$ 979.9
C. Grand Total	\$ 3,048.8	\$ 2,490.0

*\*Includes survivors of active and retired members, and children's benefits.*

**Teachers' Retirement System  
State of Montana**

**Section 5**

**Employer Contributions**

In the previous two sections, attention has been focused on the assets and actuarial liabilities of the System. A comparison of Tables 1 and 4 indicates that there is a shortfall in current actuarial assets to meet the present value of all future benefits for current members and beneficiaries. This is the universal experience in all but a fully closed-down fund where no further contributions of any sort are anticipated.

In an active system, there will always be a difference between the actuarial liabilities and the assets. This difference has to be funded with future contributions and investment returns. An actuarial valuation sets a schedule of future contributions that will deal with this funding in an orderly fashion.

The method used to determine the incidence of the contributions in various years is called the actuarial cost method. For this valuation, the entry age actuarial cost method has been used. Under this method, or essentially any actuarial cost method, the contributions required to meet the difference between current assets and current actuarial liabilities are allocated each year between two elements:

- A normal cost amount, which ideally is relatively stable as a percentage of salary over the years; and
- Whatever amount is left over, which is used to amortize what is called the unfunded actuarial liability.

The two items described above, normal cost and unfunded actuarial liability, are the keys to understanding the actuarial cost method. Let us first discuss the normal cost.

The normal cost is the theoretical contribution rate which will meet the ongoing costs of a group of average new employees. Suppose that a group of new employees were covered under a separate fund from which all benefits and to which all contributions and associated investment return were to be paid. Under the entry age actuarial cost method, the normal cost contribution rate is that level percentage of pay which would be exactly right to maintain this fund on a stable basis. If experience were to follow the actuarial assumptions exactly, the fund would be completely liquidated with the last payment to the last survivor of the group.

We have determined the normal cost rates separately by type of benefit under the System. These are summarized in Table 5.

The term "fully funded" is often applied to a system where contributions for everyone at the normal cost rate will fully pay for the benefits of existing as well as new employees. Often, systems are not fully funded, either because of benefit improvements in the past that have not been completely paid for or actuarial deficiencies that have occurred because experience has not been as favorable as anticipated. Under these circumstances, an unfunded actuarial liability (UAL) exists.

Table 6 shows how the UAL was derived for the System. Lines A and B show, respectively, the total present value of future benefits and the portion of the future liability that is expected to be paid from future normal cost contributions, both employer and employee. Line C shows the actuarial liability: the portion of the present value of future benefits not provided by future normal cost contributions. Line D shows the actuarial value of assets available for benefits. Line E shows the unfunded actuarial liability. Lines F and G show the impact of the present value of future scheduled ORP contributions (described below) on the unfunded actuarial liability.

As can be seen from this discussion, a key consideration in the adequacy of the funding of the System is how the UAL is being amortized. Table 7 shows that the current employer and member contribution rates are adequate to pay the total normal cost rate (9.71% of pay), with enough left over to amortize the UAL in 15.1 years. Therefore, the current basis is sufficient to meet future requirements.

The amortization of the UAL assumes contributions made as a percent of pay for members of the Optional Retirement Plan (ORP) until June 30, 2033. Under Section 19-21-203, periodic separate valuations are to be performed to measure the liabilities of benefits to be paid under the Teachers' Retirement System (TRS) for Montana University System (MUS) members. As of the 1996 valuation, there was a \$98.0 million difference, or shortfall, which is to be funded as a level percentage of future ORP salaries from July 1, 1997 to June 30, 2033. The single contribution rate determined as of July 1, 1997 was 3.97%. However, the following graded schedule for increasing the ORP contributions was adopted:

<b>ORP Contribution Rate</b>	<b>Fiscal Years Ending</b>
2.81%	June 30, 1998
3.12%	June 30, 1999
3.42%	June 30, 2000
3.73%	June 30, 2001
4.04%	June 30, 2002 to June 30, 2033

The value of future ORP payments included in the July 1, 2000 TRS valuation is \$96.4 million.

The recent asset gains, assumption changes and benefit changes will all have an impact on the liabilities for MUS members, as well as the TRS non-MUS members. A re-valuation of the ORP contribution rate is being performed and the result should be released shortly. This is consistent with MCA, Section 19-20-621 which prescribes periodic valuations to determine appropriate ORP contribution rates.

The unfunded actuarial liability at any date after establishment of a system is affected by any actuarial gains or losses arising when the actual experience of the system varies from the experience anticipated by the actuarial assumptions used in the valuations. To the extent actual experience as it develops differs from the assumptions used, so also will the actual emerging costs differ from the estimated costs. The impact of these differences in actual experience from the assumptions is included in Section 1, the Summary of Findings.

**Teachers' Retirement System  
State of Montana**

**Table 5**

**Normal Cost Contribution Rates  
As Percentages of Salary**

	<u>July 1, 2000</u>	<u>July 1, 1998</u>
	<u>Total</u>	<u>Total</u>
Service retirement	6.90%	6.09%
Disability retirement	0.19	0.21
Survivors' benefits	0.25	0.26
Vested retirement	0.64	0.54
Refund of member contributions	<u>1.73</u>	<u>1.78</u>
Total	9.71%	8.88%

**Teachers' Retirement System  
State of Montana**

**Table 6**

**Unfunded Actuarial Liability  
(All dollar amounts in millions)**

	<u>July 1, 2000</u>	<u>July 1, 1998</u>
A. Actuarial present value of all future benefits for present and former members and their survivors (Table 2)	\$ 3,048.8	\$ 2,490.0
B. Less actuarial present value of total future normal costs for present members	<u>400.5</u>	<u>366.7</u>
C. Actuarial liability	\$ 2,648.3	\$ 2,123.3
D. Less actuarial value of assets available for benefits (Table 1)	<u>2,247.5</u>	<u>1,809.0</u>
E. Unfunded actuarial liability	\$ 400.8	\$ 314.3
F. Less present value of future ORP contributions*	<u>96.4</u>	<u>90.6</u>
G. Unfunded actuarial liability funded by TRS contributions	\$ 304.4	\$ 223.7

*\*Paid by contributions to TRS made as a percentage of the salaries of the participants in the Optional Retirement Plan (ORP). The percentage of salary will be 3.73% for the Fiscal Year ending in 2001. The percentage of salary will be a level 4.04% for the Fiscal Years ending in 2002 through 2033.*



**Teachers' Retirement System  
State of Montana**

**Table 7**

**Recommended Contribution Rates  
As Percentages of Salary**

	<u>July 1, 2000</u>	<u>July 1, 1998</u>
A. Employer contribution rate*	7.58%	7.470%
B. Member contribution rate	<u>7.15</u>	<u>7.044</u>
C. Total contribution rate	14.73%	14.514%
D. Less total normal cost rate (Table 5)	<u>9.71</u>	<u>8.880</u>
E. Amount available to amortize unfunded actuarial liability**	5.02%	5.634%
F. Amortization period from Valuation Date	15.1 years	9.2 years***

\* *In accordance with MCA 19-20-604, the employer contribution rate will return to 7.47% when the amortization period of the System's unfunded actuarial liability is 10 years or less according to the System's latest actuarial valuation.*

\*\* *In addition, a percentage of the salaries of the participants in the Optional Retirement Plan (ORP) is available to help amortize the unfunded actuarial liability.*

\*\*\* *The amortization period as of July 1, 1998 was 9.2 years; thus, the expected period as of July 1, 2000 is 7.2 years assuming no changes in benefits or assumptions. After changes in benefits and contribution rates made in the 1999 legislative session, the expected period as of July 1, 2000 would have been 27.0 years.*

**Teachers' Retirement System  
State of Montana**

**Appendix A**

**Actuarial Procedures and Assumptions**

The actuarial assumptions used in this valuation were adopted by the Board for the July 1, 2000 Actuarial Valuation. The individual salary increase assumptions were changed as a result of our study, dated November 11, 1998. The mortality assumptions were changed as a result of our retired mortality experience study, dated May 2, 2000. These assumptions are summarized in Table A-1, A-2 and A-5.

Tables A-3 through A-6 give rates of decrement for service retirement, disablement, mortality, and other terminations of employment. These rates of decrement are referred to in actuarial literature as the absolute rate of decrement, or  $q'_x$ . Table A-7 shows the assumed probability of immediate refund of contributions among members terminating with five or more years of service.

**Actuarial Cost Method**

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate is defined to equal the total of the individual normal costs, divided by the total pay rate.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the unfunded actuarial liability. The unfunded actuarial liability is amortized as a level percentage of the projected salaries of present and future members of the System.

**Records and Data**

The data used in the valuation consist of financial information; records of age, sex, service, salary, contribution rates, and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data were supplied by the System and are accepted for valuation purposes without audit.

### **Replacement of Terminated Members**

The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.

### **Employer Contributions**

At the time of this valuation, the total employer contribution rate for normal costs and amortization of the unfunded actuarial liability was 7.58% of members' salaries. In accordance with MCA 19-20-604, the employer contribution rate will return to 7.47% when the amortization period of the System's unfunded actuarial liability is 10 years or less according to the System's latest actuarial valuation.

### **Administrative Expense**

The administrative expenses of the System are assumed to be funded by investment earnings in excess of 8% per year.

### **Valuation of Assets - Actuarial Basis**

The actuarial asset valuation method spreads asset gains and losses over five years. The expected return is determined each year based on the beginning of year market value and actual cash flows during the year. Any difference between the expected market value return and the actual market value return is recognized evenly over a period of five years. The gains and losses are measured starting with the year ended June 30, 1997. Adopted in the July 1, 2000 actuarial valuation.

### **Investment Earnings**

The annual rate of investment earnings of the assets of the System is assumed to be 8% per year, compounded annually.

### **Interest on Member Contributions**

Interest on member contributions is assumed to accrue at a rate of 6% per annum, compounded annually. This assumption was set as of July 1, 1998.

### **Postretirement Benefit Increases**

On January 1 of each year, the retirement allowance payable must be increased by 1.5% if the retiree's most recent retirement effective date is at least 36 months prior to January 1 of the year in which the adjustment is to be made.

### **Future Salaries**

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table A-2. In addition to increases in salary due to merit and longevity, this scale includes an assumed 5.0% annual rate of increase in the general wage level of the membership. The merit and longevity increases for the MUS members did not show a pattern of increasing or decreasing with service at the time of our most recent study. Therefore, the MUS members have a flat 1% merit and longevity assumption. The general wage increase assumption was adopted July 1, 1998 and the merit and longevity scales were adopted July 1, 2000.

Montana University System (MUS) members are assumed to have a 0.63% higher average final compensation to account for the larger than average annual compensation increases observed in the years immediately preceding retirement.

### **Service Retirement**

Table A-3 shows the annual assumed rates of retirement among members eligible for service retirement. Separate rates are used when a member is eligible for reduced benefits, for the first year a member is eligible for full benefits, and for the years following the first year a member is eligible for full benefits. The rates for General Members were adopted July 1, 1994. The rates for University Members were adopted July 1, 1996.

### **Disablement**

The rates of disablement used in this valuation are illustrated in Table A-4. These rates were adopted July 1, 1996.

### **Mortality**

The mortality rates used in this valuation are illustrated in Table A-5. A written description of each table used is included in Table A-1. These rates were adopted July 1, 2000.

### **Other Terminations of Employment**

The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table A-6. These rates were adopted July 1, 1996.

### **Benefits for Terminating Members**

Members terminating with less than five years of service are assumed to request an immediate withdrawal of their contributions with interest. Table A-7 shows the assumed probability of immediate refund of contributions among members terminating with five or more years of service. These rates were adopted July 1, 1996.

We estimated the present value of future benefits for terminated vested members based on their available contribution account.



**Part-Time Employees**

The valuation data for active members identify part-time members, but give no indication as to the number of hours worked. As done in the past, we imputed a "part-time percentage" by comparing the pay received with their annual equivalent full-time salary. Part-time members earning less than \$1,000 during the last year were valued at their current member contribution balance.

**Optional Retirement Program**

The total contribution received based on ORP payroll for the fiscal year ending June 30, 2000 was \$2,521,829. Based on a contribution rate of 3.42%, we assumed the total ORP payroll for the fiscal year to be \$73,737,690 (\$2,521,829 divided by 3.42%).

**Buybacks, Purchase of Service, and Military Service**

The active liabilities and normal cost were increased to 100.5% of their original value to fund this additional service based on a study of the System's experience for the five calendar years 1995 through 1999. Effective July 1, 2000.

**Probability of Marriage**

If death occurs in active status, all members are assumed to have an eligible surviving spouse and two children. The spouse is assumed to be the same age as the member.

**Teachers' Retirement System  
State of Montana**

**Table A-1**

**Summary of Valuation Assumptions  
(July 1, 2000)**

<b>I. Economic assumptions</b>		
A.	General wage increases*	5.00%
B.	Investment return	8.00%
C.	Growth in membership	0.00%
D.	Postretirement benefit increases (Starting three years after retirement)	1.50%
E.	Interest on member accounts	6.00%
<b>II. Demographic assumptions</b>		
A.	Individual salary increase due to promotion and longevity (adopted July 1, 2000)	Table A-2
B.	Retirement (General Member assumptions adopted July 1, 1994) (University Member assumptions adopted July 1, 1996)	Table A-3
C.	Disablement (adopted July 1, 1996)	Table A-4
D.	Mortality among contributing members, service retired members, and beneficiaries 1994 Group Annuity Mortality Table, with ages set back 3 years for males and ages set back 1 year for females. (adopted July 1, 2000)	Table A-5
E.	Mortality among disabled members Based on the IRS Social Security Disabled Mortality Tables published in Revenue Ruling 96-7. Males are 70% of the Male IRS table to age 80, grading into the 1983 Group Annuity Mortality Table for Males between ages 80 and 85. Females are 85% of the IRS table at all ages. (adopted July 1, 2000)	Table A-5
F.	Other terminations of employment (adopted July 1, 1996)	Table A-6
G.	Probability of retaining membership in the System upon vested termination (adopted July 1, 1996)	Table A-7

\* Montana University System (MUS) members are assumed to have a 0.63% higher average final compensation to account for the larger than average annual compensation increases observed in the years immediately preceding retirement.



**Teachers' Retirement System  
State of Montana**

**Table A-2**

**Future Salaries**

Years of Service	General Members			University Members		
	Individual Merit & Longevity	General Wage Increase	Total Salary Increase	Individual Merit & Longevity	General Wage Increase	Total Salary Increase
1	4.04%	5.00%	9.04%	1.00%	5.00%	6.00%
2	3.52	5.00	8.52	1.00	5.00	6.00
3	2.99	5.00	7.99	1.00	5.00	6.00
4	2.73	5.00	7.73	1.00	5.00	6.00
5	2.47	5.00	7.47	1.00	5.00	6.00
6	2.26	5.00	7.26	1.00	5.00	6.00
7	2.05	5.00	7.05	1.00	5.00	6.00
8	1.84	5.00	6.84	1.00	5.00	6.00
9	1.63	5.00	6.63	1.00	5.00	6.00
10	1.42	5.00	6.42	1.00	5.00	6.00
11	1.26	5.00	6.26	1.00	5.00	6.00
12	1.10	5.00	6.10	1.00	5.00	6.00
13	0.95	5.00	5.95	1.00	5.00	6.00
14	0.79	5.00	5.79	1.00	5.00	6.00
15	0.63	5.00	5.63	1.00	5.00	6.00
16	0.47	5.00	5.47	1.00	5.00	6.00
17	0.37	5.00	5.37	1.00	5.00	6.00
18	0.26	5.00	5.26	1.00	5.00	6.00
19	0.16	5.00	5.16	1.00	5.00	6.00
20	0.05	5.00	5.05	1.00	5.00	6.00
21 & Up	0.00	5.00	5.00	1.00	5.00	6.00

**Teachers' Retirement System  
State of Montana**

**Table A-3**

**Retirement**

**Annual Rates**

Age	General Members			University Members		
	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter	Eligible for Reduced Benefits	First Year Eligible for Full Benefits	Thereafter
50	5.0%	15.4%	10.0%	2.5%	9.5%	4.9%
51	5.3	15.6	10.0	2.7	9.5	4.9
52	5.6	15.8	10.0	3.0	9.5	6.8
53	6.0	16.1	10.0	3.2	9.5	6.8
54	6.3	16.4	10.0	3.4	14.0	6.8
55	6.7	16.9	12.5	3.7	15.7	6.8
56	7.1	17.5	12.5	4.2	18.2	6.8
57	7.6	18.2	12.5	4.4	18.6	7.7
58	8.0	19.2	12.5	4.9	19.2	8.6
59	8.5	20.4	12.5	5.4	20.4	10.4
60	*	22.0	20.0	*	22.0	12.2
61		22.0	20.0		22.0	14.0
62		22.0	20.0		22.0	18.2
63		22.0	20.0		22.0	14.0
64		22.0	20.0		22.0	18.2
65		22.0	20.0		22.0	26.1
66		22.0	20.0		22.0	22.2
67		22.0	20.0		22.0	22.2
68		22.0	20.0		22.0	22.2
69		22.0	20.0		22.0	22.2
70		**	**		**	**

*\*All benefits are unreduced after attaining age 60.*

*\*\*Immediate retirement is assumed at age 70 or over.*

**Teachers' Retirement System  
State of Montana**

**Table A-4**

**Disablement**

**Annual Rates**

<u>Age</u>	<u>General Members</u>	<u>University Members</u>
25	.009%	.003%
30	.018	.006
35	.036	.012
40	.063	.021
45	.108	.036
50	.164	.055
55	.248	.083
60	.377	.126

**Teachers' Retirement System  
State of Montana**

**Table A-5**

**Mortality**

**Annual Rates**

Age	Contributing Members, Service Retired Members and Beneficiaries		Disabled Members	
	Men	Women	Men	Women
25	.06%	.03%	1.92%	1.02%
30	.07	.03	2.15	1.26
35	.08	.04	2.39	1.50
40	.09	.07	2.69	1.75
45	.13	.09	3.01	2.04
50	.19	.13	3.36	2.38
55	.32	.21	3.72	2.77
60	.56	.39	4.07	3.23
65	1.01	.76	4.46	3.76
70	1.80	1.27	5.13	4.36
75	2.85	2.04	6.22	5.32
80	4.52	3.54	7.50	6.84
85	7.55	6.10	11.48	9.30

**Teachers' Retirement System  
State of Montana**

**Table A-6**

**Other Terminations of Employment  
Among Members Not Eligible to Retire**

**Annual Rates**

<u>Age</u>	<u>General and University Members</u>
25	22.22%
30	13.95
35	8.30
40	5.84
45	4.19
50	3.60
55	3.02
60	2.67

**Teachers' Retirement System  
State of Montana**

**Table A-7**

**Probability of Retaining Membership in the System  
Upon Vested Termination**

<u>Age</u>	<u>Probability of Retaining Membership</u>
25	60%
30	60
35	60
40	60
45	63
50	71
55	75



**Teachers' Retirement System  
State of Montana**

**Appendix B**

**Summary of Benefit Provisions**

Effective Date	September 1, 1937
Vesting Period	5 years. No benefits are payable unless the member has a vested right, except the return of employee contributions with interest.
Final Compensation	Average of highest 3 consecutive years of earned compensation.
Normal Form of Benefits	Life only annuity. All benefits cease upon death; however, in no event will the member receive less than the amount of employee contributions with interest.
Normal Retirement Benefits	
Eligibility:	25 years of service or age 60 and 5 years of service.
Benefit:	The retirement benefit is equal to 1/60 of final compensation for each year of service.
Early Retirement Benefits	
Eligibility:	5 years of service and age 50.
Benefit:	The retirement benefit is calculated in the same manner as described for normal retirement, but the benefit is reduced 1/2 of 1% for each of the first 60 months early and 3/10 of 1% for each of the next 60 months early.

## Death Benefit

Eligibility: 5 years of service.

Benefit: The death benefit is equal to  $\frac{1}{60}$  of final compensation for each year of service accrued at date of death, with an actuarial adjustment based on the relation of the member's age at death to the beneficiary's age. A monthly benefit of \$200 is paid to each child until age 18. In addition, a lump-sum benefit of \$500 is paid upon the death of an active or retired member.

## Disability Benefit

Eligibility: 5 years of service.

Benefit: The disability benefit is equal to  $\frac{1}{60}$  of final compensation for each year of service accrued at date of disability. The minimum benefit is  $\frac{1}{4}$  of the final compensation.

## Withdrawal Benefits

With less than 5 years of service, the accumulated employee contributions with interest are returned. With more than 5 years, the member may elect a refund of contributions with interest or leave the contributions and interest in the System and retain a vested right to retirement benefits.

## Contributions

Member: 7.150% of compensation.  
Employer: 7.580% of compensation.

MCA 19-20-604 specifies that the employer contribution rate will return to 7.47% when the amortization period of the System's unfunded actuarial liability is 10 years or less according to the System's latest actuarial valuation.

## Interest on Member Contributions

Interest on member contributions is currently being credited at a rate of 5.5% per annum.

## Cost-of-Living Adjustments

On January 1 of each year, the retirement allowance payable must be increased by 1.5% if the retiree's most recent retirement effective date is at least 36 months prior to January 1 of the year in which the adjustment is to be made.

**Teachers' Retirement System  
State of Montana**

**Appendix C**

**Valuation Data**

This valuation is based upon the membership of the System as of July 1, 2000. Membership data were supplied by the System and accepted for valuation purposes without audit. However, tests were performed to ensure that the data are sufficiently accurate for valuation purposes.

Table C-1 contains summaries of the data for contributing members. For full-time members, values shown in the tables are the numbers of members and their total and average annual salaries. For part-time members, only the numbers of members are shown.

Active Members	Number	Annual Salaries in Millions
Full-Time Members	13,289	\$ 477.2
Part-Time Members*	<u>4,245</u>	<u>42.0</u>
Total Contributing Members*	17,534	\$ 519.2
Active Members with Annual Compensation less than \$1,000	<u>886</u>	
Total Active Members	18,420	

\* *Excludes part-time members with annual compensation less than \$1,000.*

Table C-2 presents distributions of the following:

- Members receiving service retirement benefits.
- Members receiving disability retirement benefits.
- Survivors of deceased retired members receiving benefits.
- Survivors of deceased active members.
- Child beneficiaries.
- Terminated vested members.

The following is a summary of retired members and beneficiaries currently receiving benefits:

Type of Annuitant	Number	Annual Benefits in Thousands	Average Annual Benefits
Service Retirement	7,781	\$ 107,783	\$ 13,852
Survivors of Deceased Retired Members	<u>606</u>	<u>4,999</u>	<u>8,249</u>
Total Service Retirement (including survivors)	8,387	112,782	13,447
Disability Retirement	200	1,528	7,641
Survivors of Deceased Active Members	393	2,819	7,174
Child Beneficiaries	<u>41</u>	<u>98</u>	<u>2,400</u>
Total Annuitants	9,021	\$ 117,227	\$ 12,995

Terminated Members with Contributions Not Withdrawn*	Number
Vested Terminated Members	1,256
Non-Vested Terminated Members	<u>9,308</u>
Total Terminated Members	10,564

\* Includes 107 records provided in the active data with salary equal to zero and contributions greater than zero.



Teachers' Retirement System  
State of Montana

Table C-1  
Active Members Distribution of  
Full-Time Employees and Salaries  
as of July 1, 2000

Annual Salaries in Thousands - By Age Group - All Members

Age	Completed Years of Service											Totals	
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39		40+
< 25	213	1,859	287	23	0	0	0	0	0	0	0	0	2,382
25 to 29	369	6,467	5,105	6,911	2,995	0	0	0	0	0	0	0	21,847
30 to 34	233	2,253	2,535	5,261	19,348	3,174	0	0	0	0	0	0	32,803
35 to 39	137	2,263	1,613	3,780	13,744	15,499	5,515	0	0	0	0	0	42,552
40 to 44	285	1,835	1,769	2,880	13,582	14,645	23,571	6,083	0	0	0	0	64,651
45 to 49	89	2,164	1,497	3,508	13,526	18,064	21,714	30,965	11,549	0	0	0	103,077
50 to 54	154	1,322	1,716	3,174	10,511	17,042	18,246	23,456	35,517	9,039	0	0	120,176
55 to 59	118	726	403	1,241	3,398	6,025	8,191	10,582	12,981	17,711	2,282	0	63,660
60 to 64	0	146	234	292	907	1,783	2,859	3,012	3,691	5,193	3,608	174	21,898
65 to 69	0	0	0	65	249	491	657	671	250	470	575	72	3,500
70 and up	3	0	52	0	24	121	37	90	0	247	0	39	613
Totals	1,602	19,036	15,211	27,136	78,285	76,844	80,791	74,859	63,988	32,660	6,464	284	477,160



### Table C-1

**Average Annual Salary - By Age Group - All Members**

Age	Completed Years of Service												Totals
	0	1	2	3 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40+	
<25	10,144	21,368	22,111	22,794	0	0	0	0	0	0	0	0	19,527
25 to 29	8,580	21,849	22,688	23,998	26,041	0	0	0	0	0	0	0	22,593
30 to 34	9,715	22,532	24,371	25,054	28,286	32,056	0	0	0	0	0	0	26,866
35 to 39	7,626	23,821	24,078	27,000	30,341	34,064	38,034	0	0	0	0	0	30,992
40 to 44	10,970	22,655	24,235	27,167	30,799	35,121	39,549	40,554	0	0	0	0	34,207
45 to 49	8,114	26,073	24,949	27,410	31,752	36,273	40,211	42,072	42,618	0	0	0	37,442
50 to 54	11,859	27,538	30,103	30,227	34,015	36,414	42,335	45,108	44,675	44,527	0	0	40,752
55 to 59	14,723	30,270	26,882	35,467	32,366	38,135	42,887	46,011	47,899	47,482	43,883	0	43,543
60 to 64	0	18,241	33,454	36,504	34,874	37,939	44,672	46,337	45,566	57,070	54,660	43,406	46,891
65 to 69	0	0	0	16,353	41,558	49,090	59,742	47,897	41,702	47,009	71,851	71,593	50,001
70 and up	1,355	0	51,833	0	24,176	40,303	37,000	44,869	0	61,818	0	39,263	40,860
Totals	9,648	23,158	24,455	26,474	30,509	35,658	40,824	43,599	44,935	47,960	51,304	47,413	35,906

### Table C-1

**Number of Employees - By Age Group - All Members**

Part-Time Members with Annual Compensation less than \$1,000	886
Total Part-Time Members	5,131

**Teachers' Retirement System  
State of Montana**

**Table C-2**

**Distribution of Inactive Lives**

Members Receiving Service Retirement Benefits as of July 1, 2000

<u>Age</u>	<u>Number of Persons</u>	<u>Annual Benefits in Thousands</u>	<u>Average Annual Benefits</u>
<50	69	982	14,237
50 to 54	463	7,943	17,156
55 to 59	1,054	18,830	17,865
60 to 64	1,333	22,861	17,150
65 to 69	1,394	22,417	16,081
70 to 74	1,051	14,139	13,453
75 to 79	828	9,245	11,165
80 to 84	699	6,014	8,604
85 to 89	493	3,249	6,590
90 and up	397	2,102	5,295
Total	7,781	107,782	13,852

Members Receiving Disability Retirement Benefits as of July 1, 2000

<u>Age</u>	<u>Number of Persons</u>	<u>Annual Benefits in Thousands</u>	<u>Average Annual Benefits</u>
<50	20	165	8,227
50 to 54	30	268	8,946
55 to 59	27	228	8,451
60 to 64	31	251	8,108
65 to 69	20	159	7,958
70 to 74	24	177	7,359
75 to 79	17	117	6,907
80 to 84	21	111	5,287
85 to 89	7	38	5,462
90 and up	3	13	4,426
Total	200	1,528	7,641

**Teachers' Retirement System  
State of Montana**

**Table C-2**

**Distribution of Inactive Lives**

Survivors of Deceased Retired Members as of July 1, 2000

<u>Age</u>	<u>Number of Persons</u>	<u>Annual Benefits in Thousands</u>	<u>Average Annual Benefits</u>
<50	22	142	6,464
50 to 54	23	176	7,651
55 to 59	26	229	8,822
60 to 64	43	422	9,818
65 to 69	75	755	10,069
70 to 74	76	775	10,197
75 to 79	123	961	7,813
80 to 84	97	785	8,092
85 to 89	65	390	5,998
90 and up	56	363	6,486
Total	606	4,999	8,249

Survivors of Deceased Active Members as of July 1, 2000

<u>Age</u>	<u>Number of Persons</u>	<u>Annual Benefits in Thousands</u>	<u>Average Annual Benefits</u>
<50	86	399	4,643
50 to 54	56	353	6,305
55 to 59	43	437	10,156
60 to 64	37	303	8,183
65 to 69	36	308	8,563
70 to 74	46	423	9,193
75 to 79	42	353	8,399
80 to 84	28	134	4,781
85 to 89	12	70	5,815
90 and up	7	40	5,689
Total	393	2,819	7,174

**Teachers' Retirement System  
State of Montana**

**Table C-2**

**Distribution of Inactive Lives**

Terminated Vested Members as of July 1, 2000  
Number of Persons

Age	Number
<25	9
25 to 30	72
30 to 35	115
35 to 40	215
40 to 45	289
45 to 50	276
50 to 55	209
55 to 60	58
60 to 65	8
65 and up	5
Total	1,256

Child Beneficiaries as of July 1, 2000 \*  
Number of Persons

Age	Number
<5	1
5 to 6	1
7 to 8	5
9 to 10	2
11 to 12	3
13 to 14	4
15 to 16	14
17 to 18	11
Total	41

*\* Child Beneficiaries all receive \$200 per month, for a total of \$98,400 per year.*



**Teachers' Retirement System  
State of Montana**

**Appendix D**

**Comparative Schedules**

This section contains tables that summarize the experience of the System shown in present and past valuation reports.

Table D-1 shows a summary of the active members covered as of the various valuation dates.

Table D-2 shows a summary of the retired and inactive members as of the various valuation dates.

Table D-3 summarizes the contribution rates determined by each annual actuarial valuation.

Teachers' Retirement System  
State of Montana

Table D-1

Active Membership Data

Valuation Date (July 1)	Active Members								
	Full- Time Members	Part-Time Members**	Total Contributing Members**	Part-Time Members Annual Compensation less than \$1,000	Annual Full-Time Salaries in Thousands	Average Full-Time Annual Salary	Average	Average	Average
							Age**	Years of Service**	Hire Age**
1987	13,105	1,955	15,060	*	\$340,481	\$25,981	*	*	*
1989	12,546	2,541	15,087	*	339,866	27,090	*	*	*
1992	13,502	3,141	16,643	*	401,092	29,706	42.4	11.6	30.8
1994	14,938	2,637	17,575	377	416,968	27,914	42.5	11.0	31.5
1996	13,251	5,444	18,695	1,295	424,085	32,004	43.3	11.6	31.7
1998	13,545	4,647	18,192	776	459,191	33,901	44.0	12.1	31.9
2000	13,289	4,245	17,534	886	477,160	35,906	44.5	12.2	32.3

\* Not available.

\*\* Excludes part-time active members with annual compensation less than \$1,000.

**Teachers' Retirement System  
State of Montana**

**Table D-2**

**Retired and Inactive Membership Data**

Valuation Date (July 1)	All Annuitants				Terminated Members		
	Number	Annual Benefits in Thousands	Average Annual Benefit	Average Current Age	Average Age at Retirement	Number Vested Terminated	Number Non-Vested Terminated
1987	6,036	\$ 43,236	\$ 7,163	*	*	*	*
1989	6,330	49,546	7,827	*	*	*	*
1992	6,927	63,483	9,165	*	*	*	*
1994	7,530	78,183	10,383	*	*	1,105	5,722
1996	7,896	87,351	11,063	*	*	1,152	6,479
1998	8,362	99,040	11,844	69.6	57.3	1,190	8,158
2000	9,021	117,227	12,995	69.3	57.0	1,256	9,308

\* *Not available.*

Teachers' Retirement System State of Montana

Table D-3

Contribution Rates

Valuation Date (July 1)	Contribution Rates		Normal Cost Rate	UAL Rate**
	Employee	Employer		
1989*	7.044%	7.459%	8.827	5.676%
1992	7.044%	7.459%	9.876	4.627%
1994	7.044%	7.470%	9.494	5.020%
1996	7.044%	7.470%	9.328	5.186%
1998	7.044%	7.470%	8.880	5.634%
2000	7.15%	7.58%	9.71	5.02%
			14.73%	

\* Valuation performed by Hendrickson, Miller & Associates, Inc.

\*\* The unfunded actuarial liability rate is the amount available to amortize the unfunded actuarial liability. It is equal to the total contribution rate, minus the normal cost rate.

**Teachers' Retirement System  
State of Montana**

**Appendix E**

**Glossary**

The following definitions are largely excerpts from a list adopted in 1981 by the major actuarial organizations in the United States. In some cases the definitions have been modified for specific applicability to the Teachers' Retirement System Retirement System. Defined terms are capitalized throughout this Appendix.

**Actuarial Assumptions**

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disablement, and retirement; changes in compensation, rates of investment earnings, and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

**Actuarial Cost Method**

A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Liability.

**Actuarial Gain (Loss)**

A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

**Actuarial Present Value**

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

**Actuarial Valuation**

The determination, as of a valuation date, of the Normal Cost, Actuarial Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

**Actuarial Value of Assets**

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

**Actuarially Equivalent**

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

**Amortization Payment**

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Liability.

**Entry Age Actuarial Cost Method**

A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Liability.

**Normal Cost**

That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

**Actuarial Liability**

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

**Unfunded Actuarial Liability**

The excess of the Actuarial Liability over the Actuarial Value of Assets.

**Accrued Benefit**

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.



**Projected Benefits**

Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.

**Unaccrued Benefit**

The excess of an individual's Projected Benefits over the Accrued Benefits as of a specified date.

# **STATISTICAL SECTION**

**REVENUES BY SOURCE & EXPENSES BY TYPE**

**CONTRIBUTION RATES**

**ACTIVE MEMBERS**

**RETIRED MEMBERS**

**LOCATION OF BENEFIT RECIPIENTS**



### Revenues By Source

<u>Year</u>	<u>Employee Contributions</u>	<u>Employer Contributions</u>	<u>Investment Income</u>	<u>Other</u>	<u>Total</u>
1990 - 1991	\$32,611,152	\$33,274,827	\$67,033,563		\$132,919,542
1991 - 1992	34,677,311	35,759,120	70,680,973		141,117,404
1992 - 1993	37,249,490	38,088,280	78,375,511		153,713,281
1993 - 1994	38,748,884	39,164,487	73,076,482		150,989,853
1994 - 1995	37,782,158	39,071,610	72,498,507	127,416	149,479,691
1995 - 1996	39,174,350	40,626,732	98,083,315	189,823	178,074,220
1996 - 1997	40,348,306	41,639,722	104,797,668	101,267	186,886,963
1997 - 1998	41,937,700	44,476,127	102,174,892	200,083	188,788,802
1998 - 1999	42,641,714	44,986,852	102,501,716	122,732	190,253,014
1999 - 2000	45,599,246	47,848,084	112,924,791	696,779	207,068,900

### Expenses By Type

<u>Year</u>	<u>Benefit Payments</u>	<u>Withdrawals</u>	<u>Admin. Expenses</u>	<u>Investment Expenses</u>	<u>Other</u>	<u>Total</u>
1990 - 1991	\$54,869,861	\$4,243,421	\$485,918	\$191,692		\$59,790,892
1991 - 1992	60,763,611	3,307,312	684,415	180,920		64,936,258
1992 - 1993	66,012,320	3,971,610	581,165	188,655		70,753,750
1993 - 1994	70,580,682	4,156,137	647,480	198,704		75,583,003
1994 - 1995	78,589,558	3,373,147	628,596	177,081		82,768,382
1995 - 1996	83,763,230	4,158,612	684,885	12,711,571		101,318,298
1996 - 1997	88,631,324	3,839,562	675,961	12,596,802		105,743,649
1997 - 1998	94,204,970	4,826,198	881,452	10,381,523		110,294,143
1998 - 1999	100,028,083	5,126,013	1,360,660	9,686,951		116,201,707
1999 - 2000	109,231,029	5,271,306	1,293,805	10,667,097		126,463,237

## Teachers' Retirement System

### Contribution Rates

#### EMPLOYEE

1937 - 1973	5.000%
1973 - 1975	5.125%
1975 - 1977	6.125%
1977 - 1983	6.187%
1983 - 1999	7.044%
1999 -	7.150%

#### EMPLOYER

1937 - 1945	NONE
1945 - 1959	3.750%
1959 - 1969	4.000%
1969 - 1971	4.500%
1971 - 1975	5.125%
1975 - 1977	6.250%
1977 - 1981	6.312%
1981 - 09/30/81	6.432%
10/01/81 - 06/30/83	6.463%
1983 - 1985	7.320%
1985 - 1989	7.428%
1989 - 1993	7.459%
01/01/94 -	7.470%

*Unless otherwise noted, contribution rate changes occur on July 1.*

## Teachers' Retirement System

### Membership

<u>Period Ended</u>	<u>Active Members</u>	<u>Inactive Vested Members</u>	<u>Inactive Non-vested</u>	<u>Total</u>
June 30, 1991	16,281	1,102	4,469	21,852
June 30, 1992	16,643	1,167	4,890	22,700
June 30, 1993	17,211	1,171	5,375	23,757
June 30, 1994	17,439	1,113	5,761	24,313
June 30, 1995	18,062	1,130	6,201	25,393
June 30, 1996	18,332	1,012	6,050	25,394
June 30, 1997	18,222	1,173	7,560	26,955
June 30, 1998	18,205	1,179	8,061	27,445
June 30, 1999	18,287	1,209	8,612	28,108
June 30, 2000	18,423	1,245	9,212	28,880

### Retired Members and Benefit Recipients

<u>Period Ended</u>	<u>Retirement</u>	<u>Survivors</u>	<u>Disability</u>	<u>Child Benefits</u>	<u>Total</u>
June 30, 1991	5,882	339	261	46	6,528
June 30, 1992	6,042	343	263	47	6,695
June 30, 1993	6,227	355	267	50	6,899
June 30, 1994	6,531	358	271	38	7,198
June 30, 1995	6,800	365	274	35	7,474
June 30, 1996	7,011	370	273	34	7,688
June 30, 1997	7,212	366	279	44	7,901
June 30, 1998	7,400	376	276	36	8,088
June 30, 1999	7,661	377	282	38	8,358
June 30, 2000	7,927	399	291	23	8,640



### Location of Benefit Recipients

Alabama	7	New Mexico	18
Alaska	26	New York	12
Arizona	185	North Carolina	14
Arkansas	10	North Dakota	77
California	132	Ohio	12
Colorado	79	Oklahoma	16
Connecticut	5	Oregon	144
Florida	32	Pennsylvania	9
Georgia	8	South Carolina	5
Hawaii	5	South Dakota	37
Idaho	107	Tennessee	7
Illinois	11	Texas	45
Indiana	4	Utah	38
Iowa	10	Vermont	5
Kansas	10	Virginia	15
Kentucky	2	Washington	294
Louisiana	2	West Virginia	3
Maine	4	Wisconsin	28
Maryland	3	Wyoming	74
Massachusetts	5	APO	4
Michigan	12	Australia	2
Minnesota	57	Canada	14
Mississippi	2	Holland	1
Missouri	22	New Zealand	2
Montana	6,770	Puerto Rico	1
Nebraska	20	Scotland/England	2
Nevada	88	Japan	1
New Jersey	2	TOTAL	<u>*8,500</u>
		*140 recipients receive two benefits.	



